

ABSTRACT

The invention offers a position determining method that ensures high reliability in the determination of a digging position by sensing on the ground an AC magnetic field generated by a coil housed in a digging head, even in the presence of a noise magnetic field affecting the position determination. This is a digging position determining method in a non-open-cut method of excavation which senses the AC magnetic field provided from a magnetic field source by an above-ground magnetic sensor to calculate the position of the magnetic field source from the magnitude and direction of the sensed AC magnetic field. When a noise magnetic field is generated by a nearby current in addition to a signal magnetic field generated by the magnetic field source, the magnetic field sensed by the magnetic sensor is projected on a flat plane or straight line orthogonal to a vector-valued direction of the noise magnetic field and the projective component is used to calculate at least one of the position of the magnetic field source, the tilt angle of the magnetic field source that is its inclination to the vertical direction, and the azimuth direction of the magnetic field source that is its axial direction in a horizontal plane.